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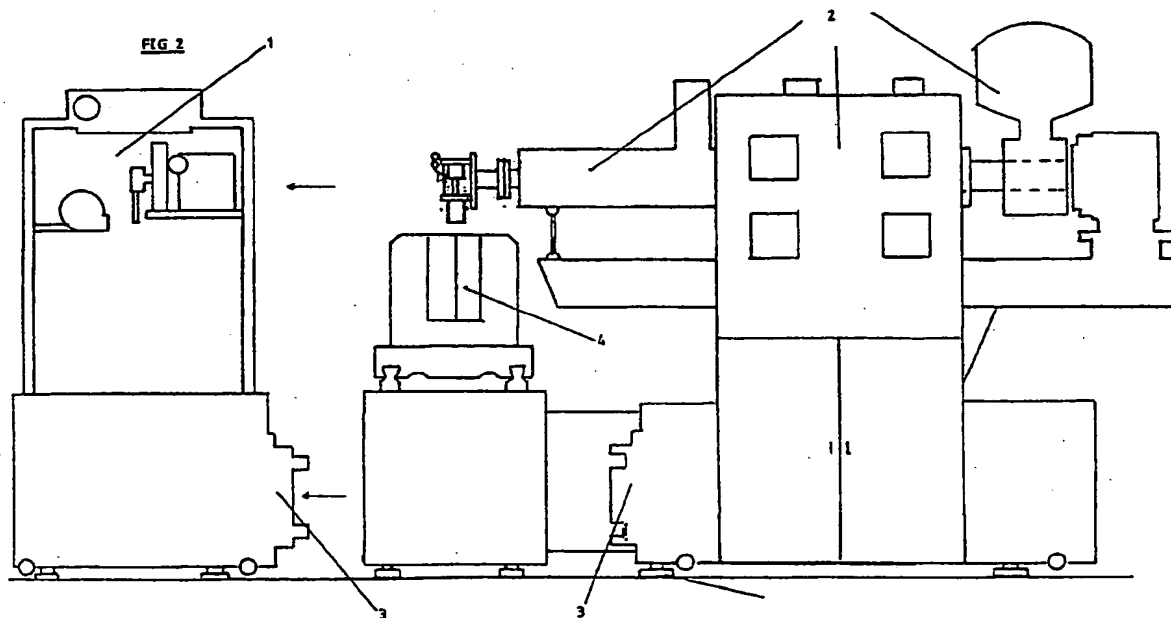
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GB 1263971 A GB 1248608 A GB 1237344 A

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## (54) Bottle form and fill system

(57) A bottle form and fill FAF system has a blow moulding unit (2) and an aseptic filling system (1), which are linked via a modular transformation docking system (3). The purpose of the FAF system is to provide alternative packaging processes. The FAF system will form, fill and seal polymer bottles of various sizes in one continuous movement or, by operating the modular transformation docking system to separate the moulding and filling modules the blow moulding unit (2) can be used to produce empty polymer bottles of various sizes and shapes, whilst the aseptic filling system can be used to package liquid products into glass/polymer bottles of various sizes and shapes.



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BOTTLE FORM AND FILL FAF SYSTEM

This invention relates to a Bottle Form and Fill FAF system.

Bottle form and fill machines are well known within the healthcare and pharmaceutical industries, and comprise of an extruder die head assembly, a split head and main mould, a traverse mechanism and a product metered filling device.

Polymer beads are fed into the extruder which melts the polymer and extrudes it as a hot polymer tube, via the die head. The polymer tube enters into the mould where the bottle base and wall is formed. The tube is cut and the mould is transferred via the traverse mechanism to the filling device. The filling tubes enter the mould and metered filling takes place under aseptic/sterile conditions. The filling tube retracts and the head mould closes, forming the bottle neck and sealing the product and bottle. The mould opens, releasing the bottle, which is now ready for use. This operation takes place as one continuous movement.

Bottle form and fill machines are, however, very expensive, large in size and an integral part of the manufacturing fabric. Additionally, they are inflexible to product size change, and require a high level of maintenance to provide optimum operating conditions.

BOTTLE FORM AND FILL FAF SYSTEM

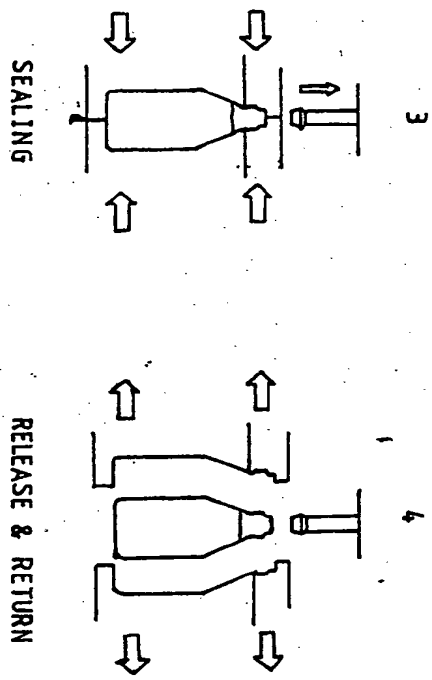
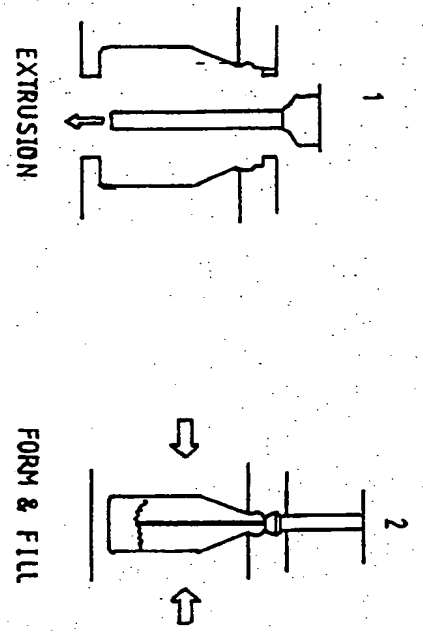
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**FIG 4**



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According to the present invention there is presented a bottle form and fill FAF system, comprising of an extruder die head assembly, a split head and main mould, a traverse mechanism, a product filling system and a modular transformation docking system.

The FAF system is designed in modular units which are self contained and mobile, being linked together via the modular transformation docking system. The FAF system, as a complete unit, will form, fill and seal polymer bottles under sterile/aseptic conditions in one continuous movement.

The modular transformation docking system provides modular units to be detached from the FAF system as required, providing mould size change to be carried out with ease. By activating the modular transformation docking system the aseptic filling system can be detached from the FAF system providing a conventional FAF blow moulding machine, and an aseptic filling system - both self contained and mobile.

A specific embodiment of the inventions will now be described by way of example, with references to the accompanying drawings:

Figure 1: shows in perspective the FAF system with the aseptic filling system linked via the modular transformation docking system.

Figure 2: illustrates the separation of the FAF system and the aseptic filling system.

Figure 3: shows the FAF system as a blow moulding machine and the aseptic filling system in its own right.

Figure 4: shows the form, fill and seal cycle of the bottle form and fill FAF system.

Referring to the drawing, the FAF system comprises of a blow moulding unit (2) which incorporates an extruder and die head assembly (5). Linked to the blow moulding unit via the modular transformation docking system (3) is the aseptic filling system (1). A traverse mechanism (6) allows the split mould (4) to move from the blow moulding unit (2) to the aseptic filling system (1).

In order to detach the aseptic filling system (1) from the blow moulding unit (2) the modular transformation docking system (3) is operated as shown in Figure 2. As the aseptic filling system (1) is detached from the blow moulding system (2) both modular units can function in their own right, as shown in Figure 3.

To re-link the aseptic filling system (1) and the blow moulding unit (2) the aseptic filling system is powered into the docking system (3) with security, obtained by fully operating the modular transformation docking system. Once in this position, as shown in Figure 1, the FAF system will operate its cycle, as shown in Figure 4.

CLAIMS

1. A bottle form and fill FAF system comprising of an extruder die head assembly, a split head and main mould, a traverse mechanism, and product filling system and a modular transformation docking system which provides the forming, filling and sealing of polymer bottles under sterile/ aseptic conditions.

By detaching the aseptic filling systems, via the modular transformation docking system, the bottle form and fill system can produce conventional empty blown polymer bottles, or can fill conventional glass/polymer bottles under aseptic conditions using the aseptic filling system.

2. A bottle form and fill FAF system, as claimed in Claim 1, wherein each component is a self contained, mobile, modular unit.

3. A bottle form and fill FAF system, as claimed in Claim 1 or Claim 2, wherein modular units are linked via the modular transformation docking system.

4. A bottle form and fill FAF system, as claimed in Claim 2 or Claim 3, wherein the modular transformation docking system provides a means to detach the aseptic filling system from the FAF system.

5. A bottle form and fill FAF system, as claimed in Claim 4, wherein the modular transformation docking system, provides conventional glass/polymer bottle filling using the detached aseptic filling system.

6. A bottle form and fill FAF system, as claimed in any preceding claim, wherein the FAF system can produce conventional blown, empty polymer bottles once the aseptic filling system is detached.

7. A bottle form and fill system, as claimed in Claim 6, wherein detachment via the modular transformation docking system provides a conventional polymer blow moulding bottle machine, and a conventional aseptic filling system.

8. A bottle form and fill system substantially as described herein, with reference to Figures 1-4 of the accompanying drawings.



<b>Patents Act 1977</b> <b>Examiner's report to the Comptroller under Section 17</b> <b>(The Search report)</b>	Application number GB 9317820.0
<b>Relevant Technical Fields</b>	Search Examiner J P LEIGHTON
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<b>Databases (see below)</b> (i) UK Patent Office collections of GB, EP, WO and US patent specifications.	Documents considered relevant following a search in respect of Claims :- 1-8
(ii) ONLINE DATABASES: WPI	

**Categories of documents**

<b>X:</b> Document indicating lack of novelty or of inventive step.	<b>P:</b> Document published on or after the declared priority date but before the filing date of the present application.
<b>Y:</b> Document indicating lack of inventive step if combined with one or more other documents of the same category.	<b>E:</b> Patent document published on or after, but with priority date earlier than, the filing date of the present application.
<b>A:</b> Document indicating technological background and/or state of the art.	<b>&amp;:</b> Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 1263971 (MASAAKI UCHIDA) see page 2 lines 99-130	1 at least
A	GB 1248608 (G HANSEN)	
A	GB 1237344 (ROBERT BOSCH)	

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